Pennsylvania Department of Environmental Protection

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April 11, 2003

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Mr. Mitch Cron (3HS43)
Remedial Project Manager
US EPA Region 3
1650 Arch Street
Philadelphia, PA 19103-2029

Dear Mr.Cron:

In response to your request in regards to Bally Groundwater Contamination Site, the following list of ARARs is provided.

The Pennsylvania Constitution, Article 1, Section 27.

"The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment."

Land Recycling and Environmental Remediation Standards Act, the Act of July 18, 1995, P.L. 4, No 1995-2, 35 P.S. Section 6026.101 et. seq. (Act 2)

Chapter 250, Administration of Land Recycling Program.

These regulations establish general provisions, cleanup standards, requirements for special industrial areas, risk assessment requirements and requirements for demonstrating attainment of cleanup standards.

Subchapter A - General Provisions
- Section 250.3 - Management of contaminated media
- Section 250.9 - Interaction with other environmental statutes
- Section 250.10 - Measurement of regulated substances in media

Subchapter C - Statewide Health Standards
- Section 250.301 - Scope
- Section 250.302 - Point of Compliance
- Section 250.303 - Aquifer determination
- Section 250.304 - MSCs for groundwater
- Section 250.305 - MSCs for soil
- Section 250.308 - Soil to groundwater pathway numeric values
- Section 250.309 - MSCs for surface water
- Section 250.311 - Evaluation of ecological receptors

Subchapter F - Exposure and Risk Determinations
Section 250.602 - Risk assessment procedures
Section 250.603 - Exposure factors for site-specific standards
Section 250.604 - Fate and transport modeling for exposure assessments
Section 250.605 - Sources of toxicity information
Section 250.606 - Development of site-specific standards

Subchapter G - Demonstration of Attainment
Section 250.702 - Attainment requirements
Section 250.704 - Attainment requirements for groundwater
Section 250.706 Attainment of surface water and air quality standards
Section 250.707 - Statistical tests

Appendix A
Table 1 - Medium-Specific Concentrations for Organic Regulated Substances in Groundwater
Table 2 - Medium-Specific Concentrations for Inorganic Regulated Substances in Groundwater

The Clean Streams Law, Act of June 22, 1937, P.L. 1987, No. 394, as amended, 35 P.S. Sections 691.1 et. seq.

To preserve and improve the purity of the waters of the Commonwealth for the protection of public health, animal and aquatic life, and for industrial consumption.

Chapter 16 - Water Quality Toxics Management Strategy.
Section 16.1 - General
Section 16.11 – Toxic substances
Section 16.21 - Long-term and short-term concepts (Aquatic Life Criteria)
Section 16.22 - Criteria development (Aquatic Life)
Section 16.23 - Sources of Information (Aquatic Life Protection)
Section 16.24 – Metals criteria
Section 16.32 - Threshold level toxic effects ((Human Health Based Criteria)
Section 16.33 - Nonthreshold effects (cancer)
Section 16.51 - Table (Appendix A, Table 1 - Levels for NPDES effluent limits)
Section 16.102 - Analytical Methods (Appendix A, Table 2)

Chapter 92 - National Pollutant Discharge Elimination System.
Sections 92.3 - Permit requirement (Must meet substantive requirements)
Section 92.7 - Reporting of new or increased discharges.
Section 92.9 - Duration of permits

Chapter 93 - Water Quality Standards.
Section 93.2 - Scope

Section 93.3 - Protected water uses
Section 93.4 - Statewide water uses
Section 93.5 - Application of water quality criteria to discharge of pollutants
Section 93.6 – General water quality criteria
Section 93.7 - Specific water quality criteria
Section 93.8 - Development of aquatic life water quality criteria
Section 93.8a - Toxic substances (references Chapter 16)
Section 93.9 - Designated water uses and water quality criteria

Pennsylvania Safe Drinking Water Act, Act of May 1, 1984, P.L. 206, 35 P.S. Sections 721.1 et. seq.

To provide an adequate supply of safe, pure drinking water essential to the public health, safety and welfare.

Chapter 109 - Safe Drinking Water
Section 109.201 - Authority
Section 109.202 - State MCLs and treatment technique requirements
Section 109.301-Monitoring requirements
Section 109.401-Public Notification
Section 109.501-Permit requirement
Section 109.601-Design and construction standards
Section 109.701-System management responsibilities
Section109.801- Laboratory certification
Section109.901- Variances and exemptions issued by the department
Section 109.1001- Bottled water and vended water system retail water facilities and bulk water hauling
Section 109.1101- Lead and copper

Please find enclosed : Health Effects and Risk Management Unregulated Contaminants Guidance

If you have any questions, please call me at (717) 705-4853.

Sincerely,

Richard Morgan

For Asuquo O. Effiong
Geologic Specialist
Environmental Cleanup Program

Enclosure

Health Effects and Risk Management Unregulated Contaminants Guidance

Introduction

To address contamination of drinking water sources by contaminants without enforceable regulatory levels (unregulated contaminants), the Division of Drinking Water Management developed a guidance which establishes a prioritization protocol for determining a guidance level in lieu of a federally promulgated MCL. This guidance level in lieu of an MCL is referred to as the **maximum unregulated contaminant concentration.** The guidance also recommends appropriate responses when the contaminant is detected in a public water system.

The first choice for a maximum unregulated contaminant concentration is an MCL proposed by EPA. In the absence of a proposed MCL, the maximum unregulated contaminant concentration is set as close to an alternate health criterion as is feasible, considering analytical and treatment technology. For chemicals in the A or B carcinogen groups, the criterion is the 10^{-6} excess lifetime cancer risk concentration. For noncarcinogens and equivocal-evidence contaminants (in carcinogen groups C, D, and E), the appropriate health criterion is the lifetime health advisory concentration.

The EPA drinking water standards and health advisory numbers are generally rounded to one significant figure. This is appropriate because using two or more significant figures implies a degree of precision that is unwarranted given the large uncertainty factors (up to 1,000) usually used in deriving the health advisories, MCLGs, and MCLs. When comparing laboratory results to a maximum unregulated contaminant concentration, the laboratory result must be rounded to the same number of significant figures as that of the maximum unregulated contaminant concentration. This is the same procedure used to determine compliance with existing MCLs. For example, if comparing a contaminant's laboratory result of 0.0447 mg/L to its maximum unregulated contaminant concentration of 0.04 mg/L, the laboratory result would be rounded to 0.04 mg/L. The rounded laboratory result does not exceed the maximum unregulated contaminant concentration and thus does not justify action associated with exceeding the maximum unregulated contaminant concentration.

Some considerations when determining the length of time a consumer should be allowed to drink water containing a contaminant exceeding the maximum unregulated contaminant concentration are:

- The concentration of the contaminant and how close it is to exceeding a HA with respect to concentration.
- Other sources of consumer exposure to the same contaminant (occupational, environmental, etc.).
- The severity of anticipated adverse health effect.

- Uncertainty factor(s) used to develop the Health Advisory (10, 100, 1000, etc.).
- Chemical mixtures (i.e., other contaminants in the water which may affect the same body organ or body function).
- All possible routes of entry to the body (ingestion, inhalation, dermal) which may compound exposure.

Non-ingestion uses of tap water which involve agitation or heating, such as bathing, showering, laundering, cleaning, dish washing, or toilet flushing, account for a large share of the total volume of water utilized by residential customers. While it is generally agreed that for most chemicals in drinking water, the risk from non-ingestion pathways is less than the risk from direct ingestion, volatile organic compounds may escape from the water in large enough concentrations during these activities to present an additional risk to the inhabitants. The activity of most concern is the showering or bathing sequence where an individual may be exposed to the contaminant by inhalation or by absorption through the skin.

EPA recognizes that dermal absorption and inhalation of chemicals in the home are factors in the overall exposure from certain chemicals. However, due to its concern about the limited data set and the uncertainty of proposed calculation methodologies, the Agency decided in 1985 not to include exposure from showering, bathing, or swimming as part of its quantitative standard-setting protocol (50 Federal Register 46895, 11/13/85). The Federal-State Toxicology and Regulatory Alliance Committee (FSTRAC), a network of federal and state regulators and risk assessors concerned with drinking water issues, concluded that dermal absorption of contaminants in tap water could, in a worst case, contribute as much as 25% of the exposure from the ingestion route. FSTRAC also concluded that inhalation of volatile contaminants evaporated from tap water during non-ingestion activities could contribute as much risk as the exposure due to ingestion ("Guidance on the Derivation of Cleanup Goals for Drinking Water Contaminants," 1988, FSTRAC).

The skin penetrants of most concern during showering, bathing, or swimming sequences are chemicals that are low molecular weight, non-ionized, and soluble in both lipids (fat) and water. Permeability coefficients and pathway exposure factors are useful tools in evaluating the contribution of inhalation and dermal exposure to the total body burden, but are available for only a few environmental contaminants. Based on their permeability coefficients, ethylbenzene, styrene, and toluene have been experimentaly identified as potential water supply contaminants which may pose a significant dermal absorption hazard at low concentrations normally of concern via ingestion.

Henry's Law Constant, which considers vapor pressure, solubility and molecular weight, is a commonly available physicochemical parameter that may be used to evaluate a contaminant's tendency to volatilize. A Henry's Law Constant for a contaminant above 0.001 atm m^3/mole suggests volatilization and subsequent inhalation as a potentially significant route of exposure.

When the concentration of a chemical potentially able to pose a significant risk from inhalation or dermal exposure is elevated enough to warrant an alternate source of water for drinking, it is important to also consider a replacement of water for bathing and showering activities. In these situations, simply providing bottled water for drinking may not adequately protect the consumers from the contamination of their water supply.

The Unregulated Contaminants Guidance

The "Unregulated Contaminants Guidance" pertains to all unregulated chemical contaminants **except radon and the four unregulated contaminants which comprise the total trihalomethane MCL (bromoform, bromodichloromethane, chloroform, and chlorodibromomethane)**. The guidance replaces all previous guidances for the unregulated contaminants.

The guidance is divided into three parts. Part I defines the terms used in the guidance. Part II describes the procedure used to determine the maximum unregulated contaminant concentrations. Part III recommends actions to follow when an unregulated contaminant is detected in a public water system.

Part I - Definitions

1. Carcinogenic contaminant - A cancer-causing contaminant which has been classified by EPA as a known (Group A) or probable (Group B) human carcinogen.
2. Health advisory - The highest concentration of a contaminant in drinking water not expected to cause any noncarcinogenic adverse health effects when the water is consumed for a period of time not exceeding a specified maximum exposure period. Health advisories will normally be provided by the EPA. EPA has developed health advisories for one-day, ten-day, longer-term (approximately seven years) and lifetime exposures.
3. Lifetime cancer risk - The chance that an individual exposed to a carcinogenic contaminant in drinking water for a period of 70 years will contract cancer due to the carcinogenic contaminant in the drinking water. A lifetime cancer risk of 10^{-6} indicates that one person out of 1,000,000 people exposed to the carcinogen at a specified concentration associated with the 10^{-6} cancer risk will probably contract cancer sometime during his or her lifetime due to the carcinogen in the drinking water.
4. Maximum unregulated contaminant concentration - The maximum allowable concentration of an unregulated contaminant in finished water, as determined by the Department.
5. Method detection limit (MDL) - The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the true value is greater than zero, as determined by EPA.
6. Practical quantitation level (PQL) - The lowest level of a substance in water that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions, as determined by EPA.

7. Unregulated contaminant - A contaminant for which no maximum contaminant level or treatment technique has been established under **§109.202** of the Pennsylvania Safe Drinking Water Regulations (relating to state maximum contaminant levels and treatment technique requirements).

Part II - Maximum Unregulated Contaminant Concentrations

The maximum unregulated contaminant concentration for each contaminant, if available, is listed in the Contaminant Summaries. As revised information becomes available, the maximum unregulated contaminant concentration will be updated. The maximum unregulated contaminant concentrations are determined using the following criteria:

1. The maximum unregulated contaminant concentration will be the concentration at which EPA has proposed to set or is considering setting a primary maximum contaminant level for the contaminant; or,
2. If EPA has not established a concentration as set forth in above paragraph, the maximum unregulated contaminant concentration will be the concentration associated with a lifetime cancer risk of 10^{-6} for carcinogenic contaminants or the concentration equal to the lifetime health advisory for noncarcinogenic contaminants, provided that this concentration is equal to or greater than the practical quantitation level and achievable through the use of available treatment technology; or
3. If the concentration specified in the above paragraph is not equal to or greater than the practical quantitation level or is not achievable through the use of available treatment technology, the maximum unregulated contaminant concentration will be set at the lowest concentration these limiting factors will allow.

Future maximum unregulated contaminant concentrations will also be established using the preceding criteria.

Part III - Compliance/Required Action

Public water systems shall supply finished water that complies with the maximum unregulated contaminant concentrations determined according to Part II above. Compliance with the maximum unregulated contaminant concentration shall be based on the running annual average concentration of quarterly results when monitoring is conducted quarterly or more frequently. If monitoring frequency is annual or less frequent, compliance shall be based on the average of the initial sample and a check sample.

When a single monitoring sample demonstrates that an unregulated contaminant is present in a concentration equal to or greater than the EPA method detection limit (see the Chemical Analysis Table following the guidance in this document), the water supplier shall be required to take a check sample from the same sampling point within 24 hours of receipt of the sample results indicating detection of the unregulated contaminant. (This

requirement does not apply to new source sampling conducted under **§109.503(a)(1)(iii)(B)** of the Safe Drinking Water Regulations). If detection of an unregulated contaminant is verified as described above, the water supplier shall do the following:

- **1.** Where the average concentration of the original and a check sample is equal to or greater than the method detection limit (MDL) but less than or equal to the maximum unregulated contaminant concentration, the water supplier (community and noncommunity) shall be required to monitor at least quarterly at the entry point(s) for the detected contaminants. After the analyses of four consecutive quarterly samples demonstrates that the concentration of the contaminant in each quarterly sample does not exceed the maximum unregulated contaminant concentration, the Department may reduce the required monitoring to one sample per entry point per year, or less frequently, as appropriate, to protect public health.

  The Department may establish more appropriate sampling points if the source of contamination is within the distribution system.
- **2.** Where the average concentration of the original and a check sample is determined to exceed the maximum unregulated contaminant concentration, but is less than a concentration which poses an imminent hazard to public health, the following shall be provided:
  - **a.** Public notification:
    - **(1)** Request that the community water supplier, except a bottled water, vended water, or bulk water supplier, at a minimum, provide public notification in a form approved by the Department as follows:
      - **(a)** The water supplier shall, at a minimum, publish the notice within 14 days on 3 consecutive days in a newspaper of general circulation within the area served by the community water system and at least once every 3 months so long as a concentration greater than the maximum unregulated contaminant concentration continues. If the area served by the community water system is not served by a daily newspaper of general circulation, the water supplier shall publish the notice on three consecutive weeks in a weekly newspaper of general circulation serving the area. If no weekly or daily newspaper of general circulation serves the area, notice shall be given within 14 days by posting the notice continuously so long as the contaminant level continues to remain above the maximum unregulated contaminant level in prominent public places within the area served by the community water system or by hand delivery to each customer. If posting, and if the maximum unregulated contaminant concentration exceedance has been corrected prior to the start of posting, the notice shall be posted for a minimum of 14 days.

- **(b)** The water supplier by mail delivery, either by direct mail or with the water bill, or by hand delivery notice shall give direct written notice to each customer within 45 days after the water supplier learns of the maximum unregulated contaminant concentration exceedance. Additional written notice shall be sent or hand delivered to each customer at least once every 3 months so long as the maximum unregulated contaminant concentration exceedance continues.
- **(c)** The water supplier having a continuing maximum unregulated contaminant concentration exceedance where public notification is necessitated shall give a copy of the most recent public notification to all new or transferred billing units or new hookups prior to or at the time service begins.
- **(d)** If a water supplier required to provide public notification serves a billing unit, such as an apartment complex, school, hospital, nursing home, or business in which there are consumers who are not directly notified by the supplier, the following language shall be included in the notice:

  "If you, as our customer, have received this notice and there are consumers receiving water from you, such as tenants, residents, patients, students, or employees, you should make this notice available to them by posting it in a conspicuous location and by direct hand or mail delivery."

- **(2)** The noncommunity water supplier, including a nontransient noncommunity water supplier shall, at a minimum, within 14 days after the supplier learns of the maximum unregulated contaminant concentration exceedance, post the notice continuously so long as the exceedance continues or for a minimum of 14 days, if the exceedance has been corrected prior to the start of posting. The water supplier shall post the notice in conspicuous locations where it can be seen by consumers.

- **b.** Monitoring - the water supplier (community and noncommunity) shall be required to monitor at least quarterly at the entry point(s) for the detected contaminants. After the analyses of four consecutive quarterly samples demonstrates that the concentration of the contaminant in each quarterly sample does not exceed the maximum unregulated contaminant concentration, the Department may reduce the required monitoring to one sample per entry point per year.

  The Department may establish more appropriate sampling points if the source of contamination is within the distribution system.

- **c.** For all bottled water, vended water, retail water, and bulk water for which the average of the original and a check sample exceeds the maximum unregulated contaminant concentration, the water supplier shall recall the contaminated water and cease distribution until the contaminant concentration is equal to or less than the maximum unregulated contaminant concentration.

- 3. Where the average concentration of the original and a check sample is determined by the Department to pose an imminent hazard to public health, the public water supplier shall provide the following:
  - **a.** Public Notification - The public water supplier shall issue a water supply warning approved by the Department. The public water supplier is responsible for disseminating the notice in a manner designed to inform users who may be affected by the problem.
    - **(1)** Within 4 hours of the Department's determination that an imminent hazard is present, the public water supplier shall provide the notice to newspapers, radio, and television media serving the affected public, or directly notify all affected users in a manner approved by the Department. The public water supplier shall also notify key public officials as designated in the public water system's emergency response plan.
    - **(2)** The Department may require the public water supplier to further disseminate the notice in an appropriate manner which may include direct mailings, publication in newspapers or other paid advertising or postings. In the event the public water system is a place, other than a private residence, in which persons under the age of 18 are cared for or educated, such as a day care center or school, notice issued shall also be disseminated individually to the parent(s) or guardian(s) of those persons.
    - **(3)** A water supply warning must be followed by further notices designed to inform the public on a continuing basis as to the expected duration of the hazard, progress towards solving the problem, and measures that should be taken by users to reduce their risk. These notices shall be given at intervals in a manner directed by the Department as long as the threat to public health continues.
    - **(4)** The water supply warning shall continue until the Department is satisfied that no significant threat to the public health remains and approves a notice canceling the water supply warning. The public water supplier shall be responsible for disseminating the cancellation of the water supply warning. The public water supplier shall be responsible for disseminating the cancellation of the water supply warning in a manner similar to the issuance of the warning.
  - **b.** Monitoring - The water supplier shall be required to monitor at least daily at the entry point(s) for the detected contaminant until the weekly average concentration of the daily samples indicates the contaminant no

longer poses an imminent threat. Monitoring will then continue as in Part III-2 above.

- **4.** For systems which have installed treatment to remove an unregulated contaminant, monitoring for the unregulated contaminant for which treatment has been installed shall be conducted at least quarterly.
- **5.** Every effort will be made to keep the VTX Contaminant Summary Infobase and Contaminant Summary Table current with revised information, but verification from the Division of Drinking Water Management may be necessary before actions are taken.

Health Effects and Risk Management Contaminant Summaries

- Sources of Data
- Description of Terms and Abbreviations
- Index of Contaminant Summaries : Chemicals Beginning with . . .
  A | B | C | D | E to F | G to L | M | N to P | Q to S | T | U to Z
- External Link to an index of EPA's Chemical-Specific Fact Sheets for chemicals regulated in Phases 1 through 5. Published in **October 1995**. Useful summaries of chemical and physical properties, drinking water standards, health effects, usage patterns, release patterns, and environmental fate.

Sources of Data

The Environmental Protection Agency's (EPA) Office of Water is the source of the data in the health advisory, carcinogenic potential, practical quantitation, and best available technology sections of the Contaminant Summaries.

The "Final MCL" in the Regulatory Levels section is the enforceable maximum level for contaminants in drinking water supplied by Pennsylvania public water systems and is based on Pennsylvania Safe Drinking Water Regulations (Pennsylvania Code, Title 25, Chapter 109). In most cases, Pennsylvania incorporated the primary MCLs in the National Primary Drinking Water Regulations as State MCLs by reference. The remainder of the data in the Regulatory Levels section is based on EPA Office of Water documents.

To assist drinking water program staff faced with detection of chemicals in public water systems for which EPA has not determined a final MCL (unregulated contaminants), the Bureau of Water Supply Management evaluated the available health and analytical/treatment data developed by EPA. And where the data was sufficiently extensive, the Bureau selected the most pertinent data item (usually a proposed MCL or life-time health advisory) and designated it as the Maximum Unregulated Contaminant Concentration.

p-Dioxane CAS No: 123-91-1 8/2000

... Non-carcinogenic Health Advisories (mg/L)

Child One-Day: 4
Child Ten-Day: 0.4

... Carcinogenic Potential, By Ingestion

Carcinogen Group: B2
One-in-a-Million Cancer Risk (mg/L): 0.003

... Regulatory Levels (mg/L)

Not Determined

... Unregulated Contaminant Guidance

Maximum Unregulated
Contaminant Concentration (mg/L): 0.003